Successful Methods

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Making History

THOSE who could not attend the Convention and Road Show at Chicago early in January missed a great business opportunity. These two annual events have for several years grown and improved at a rate that has been most satisfactory. To many they have come to be a serious business proposition. In fact, it would be difficult to overestimate their importance to the highway industry.

The Road Show eclipsed in every way all previous records. The attendance was larger than ever before. There also were more men engaged directly in highway work. It further was noticeable that county and town officials and contractors were out in larger numbers than at any previous Show.

Last year it seemed that the size and number of exhibits had reached the peak. This year there were nearly four times as many large machines exhibited. There was also evidence on every hand of an unusual effort on the part of the exhibitors to show the best they had. Many new machines were displayed. There was likewise a remarkable number of improvements in established designs.

The chief criticism of the Road Show was that it was too crowded. Some exhibitors also complained over lack of sufficient space. No practical solution of this problem has yet been suggested. When one stops to consider that over 270 carloads of machinery, many units of which weighed over 20 tons each, were in place, it is plain that the great uptown armory in New York is the only building in America at present that could house the Road Show as well as the Coliseum and adjacent buildings. And a national exhibition in New York would be too far off center to work. Until some better site is offered, therefore, the Road Show likely will remain in Chicago.

The Convention program this year was largely along the lines followed in recent years. The attendance was good; in fact, the immense hall was overcrowded during several sessions. There was, however, much well merited criticism of the program. The most com mon complaint was that the papers were almost entirely technical and suitable more for a meeting of officials.

The lack of an opportunity for contractors and for manufacturers to air their views is evident from the printed programs. The American Road Builders' Association must realize that it is looked upon as an organization in which officials, contractors and manufacturers meet on common ground to work out their common problems. If it will shape its programs for future conventions with this point of view the Association can become the leading factor in the highway movement of this country. Unless the programs are made less technical the meetings of national and State highway officials are likely to supersede the convention of the Association. The officials of the Association have, however, been keen in recent years to keep pace with progress in the industry. They will certainly arise to the occasion in this particular case.

A Bad Season Ahead

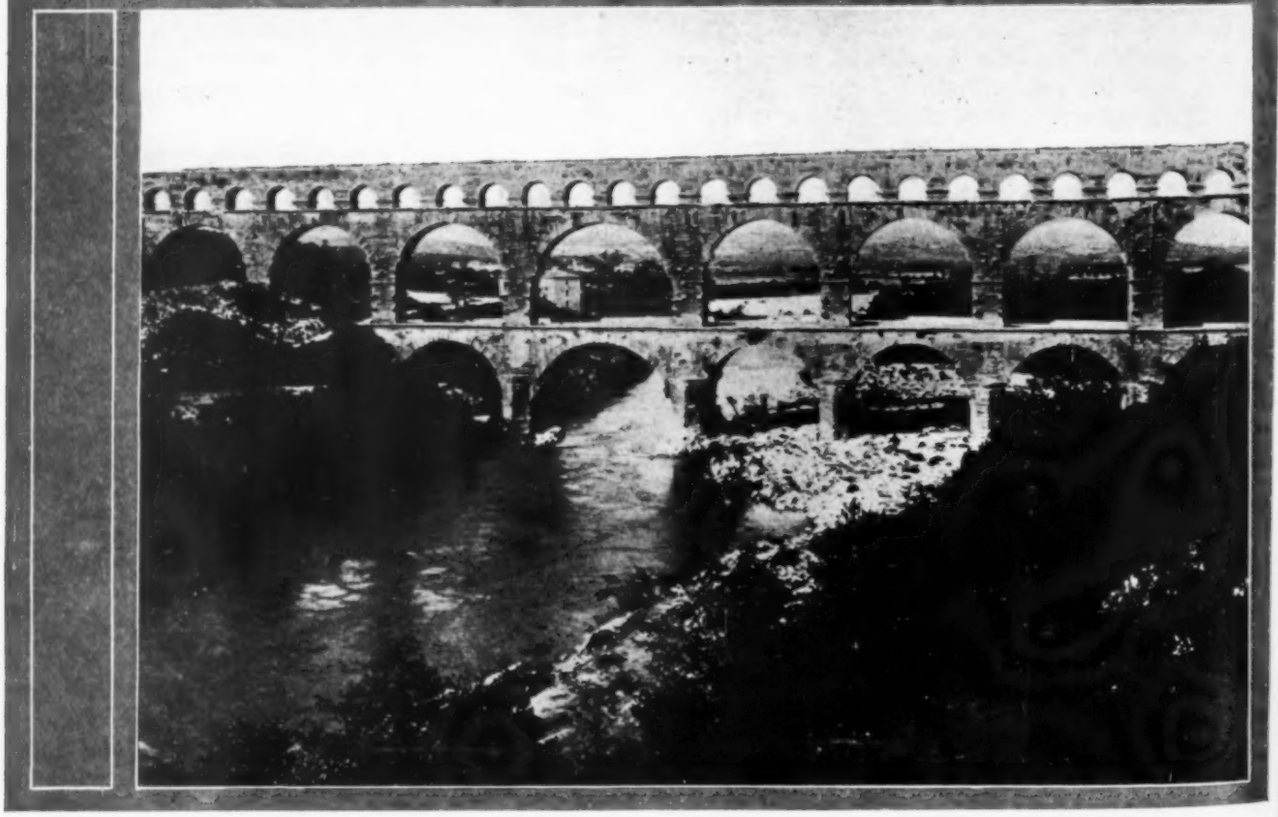
THERE always is a bad season ahead for a lot of construction people. If we were to have this year the most favorable weather for outdoor work that we have had in years, still a lot of folks would be kicking along in October. Come a couple of weeks of cold and rain early in the fall and they would swear they had been ruined by it. But somehow the fellows who get done and make a profit do not put up a little spell of bad weather at the end of the season as an alibi to their backers.

Look around a bit and you will soon see one big reason for the difference between these two classes of construction men. The successful lot are on the job now. They have been over their equipment, shaping it up before warm weather comes. Weak boiler tubes have been replaced, bearings have been babbitted, gaskets renewed, missing parts restored, every piece of equipment is ready to go into the line and hold its place.

How about the Alibi Ikes? They are charter members of the hot-stove league. February is no time for one of them to be out fooling around machinery. The seven-up game, or a cross-word puzzle, or the radio are much more attractive. And you can just about visualize what their plant looks like when they kick off in April or May. Along about the first steady spell of fair weather, when the good outfits are going strong, then on the other fellow's job out goes a boiler tube, or a main bearing burns. There follows a mad scramble to get fixed up again—by that time it begins to rain.

Now's the time, boys, to give all the plant and equipment a real going over. It will give you lots better chance to make a good record this year. Then that cold spell in October will not seem nearly so bad.

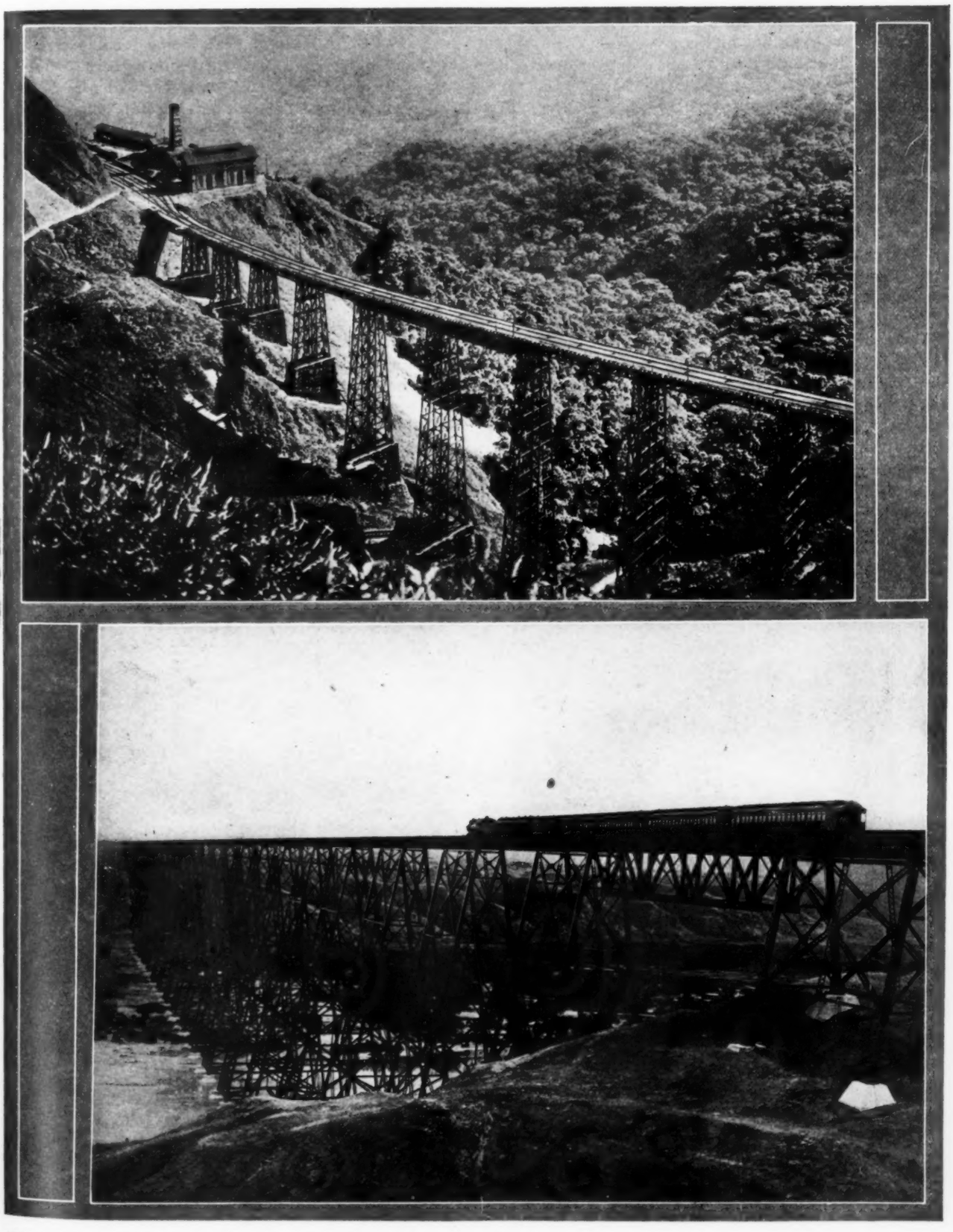
Ancient and Modern



Above: A Peruvian suspension bridge which is strong enough to support the llamas which may be seen at the right. © Keystone.

Below: One of the ancient bridges of the old world. This structure was built by the Romans in France and is still doing

Bridge Construction



Above: A modern railroad bridge in Sao Paulo, Brazil. © *International.*
Below: The great Lethbridge Viaduct in Alberta, Canada, 759 miles west of Winnipeg. This new steel structure is 5327 ft. in length. © *Keystone.*

GETTING NEW YORK'S SNOW OUT OF THE STREETS

Cranes Mounted on Motor Trucks Are Making Good

EACH year sees some new development in snow removal methods in New York City. Thus far this year New York has had almost twice the average amount of snow, and ever since the storm which deposited 11 in. of snow on the city on Jan. 2 the work of getting rid of the snow has been going on steadily. This storm was followed on Jan. 5 by a 2½-in. snow fall; on Jan. 20 by a 7-in. fall, and on Jan. 27 by 4 in. more.

Under the system followed at present in New York, the Street Cleaning Department clears the streets with plows or other devices and piles the snow at the side of the street in piles 4 or 5 ft. in height. The work of removing these piles is let to contractors and these contractors are free to adopt whatever means they choose to handle their end of the work.

Various machines have been tried out in the last few years with varying degrees of success, but the most notable development in New York this winter is the introduction of cranes mounted on motor trucks and equipped with either light snow buckets or regular heavy duty clamshell buckets. In the last few weeks eight or nine of these cranes have been at work in New York. Most of them come from outside the city, being brought here by their owners, who will take them back when the snow removing is finished and put them to work at their regular jobs.

One group of cranes was brought all the way from Perth Amboy, several others came from Newark, and one from just across the Hudson. They were rushed in at motor truck speed and got to work the moment they reached the city. E. C. Goodwin, examining engineer for the Street Cleaning Department, has naturally been watching very closely the performances of the various machines. He seems to think that the cranes are doing excellent work and some rough data which his office has prepared shows that the cranes are filling 9 and 10-yd. trucks in from 2½ to 3½ min. The speed with which they handle the snow is, of course, dependent to a large extent on the skill of the operator, but as many of the cranes are operated by men who have handled them while on their

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CLEARING SNOW ON BROADWAY IN THE THEATER DISTRICT

regular work, there has been little or no time lost because of faulty operation. One crane made a record of 225 truck loads of snow in 9 hr. Nine trucks succeeded in keeping this crane busy as long as it was on the street.

Most of the cranes are equipped with heavy duty clamshell buckets, and on the average these heavier buckets have proved more efficient than the lighter buckets, especially when handling piles of snow that have been frozen. Much of the work of cleaning up after the first storm consisted in removing these frozen piles and the heavy buckets, which at first seemed unnecessarily heavy for soft snow, proved their worth.

TAKING A BIG BITE

Only two or three men are needed to operate a crane. The driver of the motor truck keeps his engine running all the time, so as to be ready to proceed to the next pile without delay, and the crane operator handles the job of running the crane. Some of the cranes also have a third man, who stays on the ground and when necessary loosens the snow a little. He is not altogether necessary, however, and some of the cranes have been getting on without the third man.

The cranes, with their clamshell buckets, make a neat job, clearing the snow away right down to the pavement.

The Commissioner of Street Cleaning at present is A. A. Taylor. His department has charge of snow removal in three boroughs, which means clearing 1060 miles of street. The boroughs of Richmond and Queens have their

© Keystone.

THE MOPPING UP PROCESS TAKES A WEEK OR MORE

own street cleaning bureaus.

Up to the present New York City has appropriated $3,500,000 for snow removal since Jan. 1. This is not all spent yet, but the Jan. 27 snow probably will use up the remainder of this fund, and if further storms occur Commissioner Taylor will probably have to obtain more money from the Board of Estimate.

The main streets, such as Broadway, Fifth Avenue and Forty-second Street, are cleaned first, but the plows keep right on going until the entire 1060 miles are taken care of. The contractors follow right on the heels of the plows and their jobs often last a week or two after the plows have gone back to the barn.

© Keystone.

THE BUCKET CLEANS UP THE ENTIRE PILE

The whole history of snow removal in New York and other large cities in the last few years has been the steady increase in the use of machinery and the elimination so far as possible of hand labor. It always has been a difficult job to obtain efficient workmen for snow removal, as the really efficient men generally have obtained a warm job indoors at this season of the year. The employment of a large force of snow shovelers never will be entirely done away with, as they are necessary in a great many phases of the work. They are still being used in great numbers on just the sort of job that these cranes are doing and in the last few weeks thousands of trucks in New York have been painstakingly loaded by men equipped with hand shovels.

It is hard to make an accurate comparison between the amount of work that a crane can do and the work which can be accomplished by a gang of shovelers. One contractor who has been removing snow figures that a crane replaces at least 50 men, and in addition has the added virtue of not feeling it necessary to warm its hands every few minutes.

The introduction of machinery has done much to solve the snow removal problem in cities, and the use of cranes in New York this year has been a big step toward the solution of that problem.

ROAD SHOW SETS NEW ATTENDANCE MARK

THE Convention and show of the American Road Builders' Association, held in Chicago, Jan. 5 to 9, again set a new attendance mark. The exact number of persons who registered has not yet been announced, but last year's total was passed when the Road Show still had a day to run. The American Road Builders' Association added one more splendid success to its history, which extends back for more than a score of years.

The most striking proof of the fact that the Convention and Show had brought a great throng to Chicago was the statement made by the Hotel Committee of the Chicago Association of Commerce, which said that the hotels of Chicago were more crowded than ever before in the history of the city. The Association of Commerce keeps an accurate check on the number of rooms occupied in the Chicago hotels and on at least two evenings while the American Road Builders' Association Convention and Show were in progress there was not a room vacant in any hotel in Chicago, with the exception of one or two hotels which are situated several miles from the center of town. Several other associations interested in or allied with highway construction held their conventions in Chicago at the same time in order that their members might attend the American Road Builders' Association Convention and Show.

Contractors and country and town officials were more in evidence at Chicago this year than ever before. Every State was represented and there were a number of visitors from foreign countries.

The Convention and Show of the American Road Builders' Association have come to be the big event of the year for the man who is engaged in any phase of highway work, whether he is the man who actually builds the road or the representative of the community in which it is being built.

The exact date of the 1926 Show has not yet been announced. As soon as it is it will be published in SUCCESSFUL METHODS in order that the readers of this magazine may have ample opportunity to make arrangements for attending.

BUCKET LOADER SHOWS VERSATILITY

California Contractors Use It for Both Cellar Excavation and Road Building

A GOOD all-around tool that he can use for a variety of purposes is always a favorite with the average contractor. Kuhn Brothers of Manhattan Beach, Cal., are rather proud of a bucket loader which they keep shifting from one class of work to another.

The photograph at the bottom of this page shows this bucket loader engaged in cellar excavation. The territory in which Kuhn Brothers work is sandy and hilly, making it necessary to excavate from 100 to 2000 yd. for every building and dwelling. This work is a little too small to justify the use of a shovel and the bucket loader has proved just the machine to handle the work quickly and efficiently.

On this sort of work the bucket loader operates even in the heaviest sand. Sheet steel is laid down behind it in order to provide a firm footing for the trucks. The bucket loader has replaced teams and labor on a number of such jobs.

One excavation job which is completed consisted of opening up a street in the city of Hermosa Beach. This street was covered with sand to a depth of 10 ft. and the bucket loader was used to pick it up and deposit it in 5-yd. trucks. With three of these trucks in operation, most of the time and sometimes only two, with a haul to a dump approximately a mile away, the loader handled 500 yd. of sand a day. The average time for loading a truck was 3 min. and the best record was 1¾ min.

Kuhn Brothers also run one of the largest sand pits in Los Angeles County and have used the bucket loader on that work, loading trucks from the storage piles.

Another activity of the firm is roadbuilding, and last summer contracts were obtained for two stretches of concrete road in Los Angeles County, one at Compton and one at Downey. These roads, which were old macadam highways, at first had to be rooted up, the rock removed from the grade, the grade lowered about 2 ft. and the rock replaced to a depth of from 3 to 6 in. and bound with a thin layer of disintegrated granite. The concrete was then laid on this sub-base after it had been thoroughly compacted by watering and rolling. The bucket loader was used on these jobs to pick up the old macadam from the grade and later to replace the rock after the grade had been lowered. On one of the jobs where the material removed had to be hauled away the bucket loader was used to make the cut and load the trucks and did this part of the work without difficulty.

EXCAVATING A CELLAR IN SANDY SOIL

THE WILLIAM MULHOLLAND HIGHWAY

Los Angeles Names Scenic Road in Honor of Noted Builder

By S. T. H.

THE William Mulholland Highway, a 55-mile scenic drive along the mountains overlooking Los Angeles and the Pacific Ocean, is a fitting tribute to an engineer, a constructor and a man whose vision and ability have made possible the phenomenal growth of that wonder city. Without an ample water supply and cheap electrical power, Los Angeles would have reached her limit of growth long ago. Mr. Mulholland conceived plans for both, and he executed these plans in a most practical way at a reasonable cost. Now he is at work on plans for a vast additional water supply and power for the city for which he has done so much.

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MR. MULHOLLAND WITH THE GOLDEN KEY

The new drive is outstanding among the many unusual attractions of Southern California. Wonderful as it may be, it is well graced by the name which has been chosen for it, because certainly few men in public life have so well merited the confidence that all Southern California has reposed in William Mulholland for more than three decades.

In Successful Methods for July, 1921, there appeared a brief sketch of some of Mr. Mulholland's

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ALL READY FOR THE GRAND OPENING

achievements. Reference also was made there to how Los Angeles has had absolute trust in all his plans and policies. Since then Mr. Mulholland has several times been placed temporarily, by unprecedented climatic conditions and by hostile business interests, in positions which would instantly have ended an ordinary official's term. But William Mulholland is no ordinary man. He has grown stronger with the public year by year until he stands today a unique figure in American official life. Los Angeles is proud of him.

Probably the most significant feature of the naming of the new highway is that most of Mr. Mulholland's activities have been in the water supply and power development projects of Los Angeles. In connection with these he has solved many road problems. He is not, however, essentially a highway engineer or builder. Hence, it is all the more noteworthy to have had a great highway named after him.

SHORING UP A SHAKY WALL

BY a clever bit of reconstruction C. H. Everitt, a Buffalo contractor and builder has turned what might have been a serious accident into an asset, and has saved a building that looked doomed for the rubbish heap after part of one wall had entirely collapsed.

The building is the Schmidt Building, a five-story brick affair in Buffalo. Two doors from the Schmidt Building is a big hotel, and when the hotel recently decided to build an addition, Everitt took the contract to tear out the building between the hotel and the Schmidt Building and put the addition in.

KEEPING WALL IN PLACE WITH CROSS BRACES

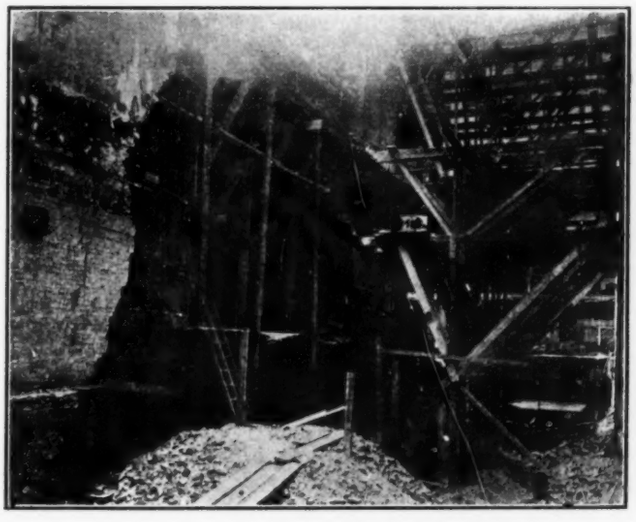
The Schmidt building is nearly 80 years old. When the old building between it and the hotel was taken out the support it gave was compensated for by heavy wooden braces placed across the gap on the level of each floor, the excavation being carried on below the level of the lowest row of braces.

A week of heavy rains and the excavation undermined what had been the party wall between the Schmidt building and the one removed, and the wall suddenly gave way, three men who were in the pit at the time escaping death almost by a miracle. Examination revealed that the floor girders had never been properly tied into the party wall in the Schmidt building, being simply set in notches made to receive them.

At first it was thought it would be necessary to tear down the entire Schmidt building and reconstruct it, but the difficulty was avoided by a clever bit of engineering. Heavy triangular braces were placed in the excavation, based on the foundations of the hotel, and the transverse braces from the hotel to the floors of the Schmidt building were doubled. At the same time an elaborate system of cross-braces was constructed in the Schmidt building and reinforced with vertical members, the resulting system of braces being sufficient to care for the entire weight of the upper floors without any assistance from the walls.

The remainder of the old party wall was then removed, and a new wall constructed in its place. At the same time, some of the girders in the second floor of the Schmidt building, which showed signs of wear, being torn out and replaced.

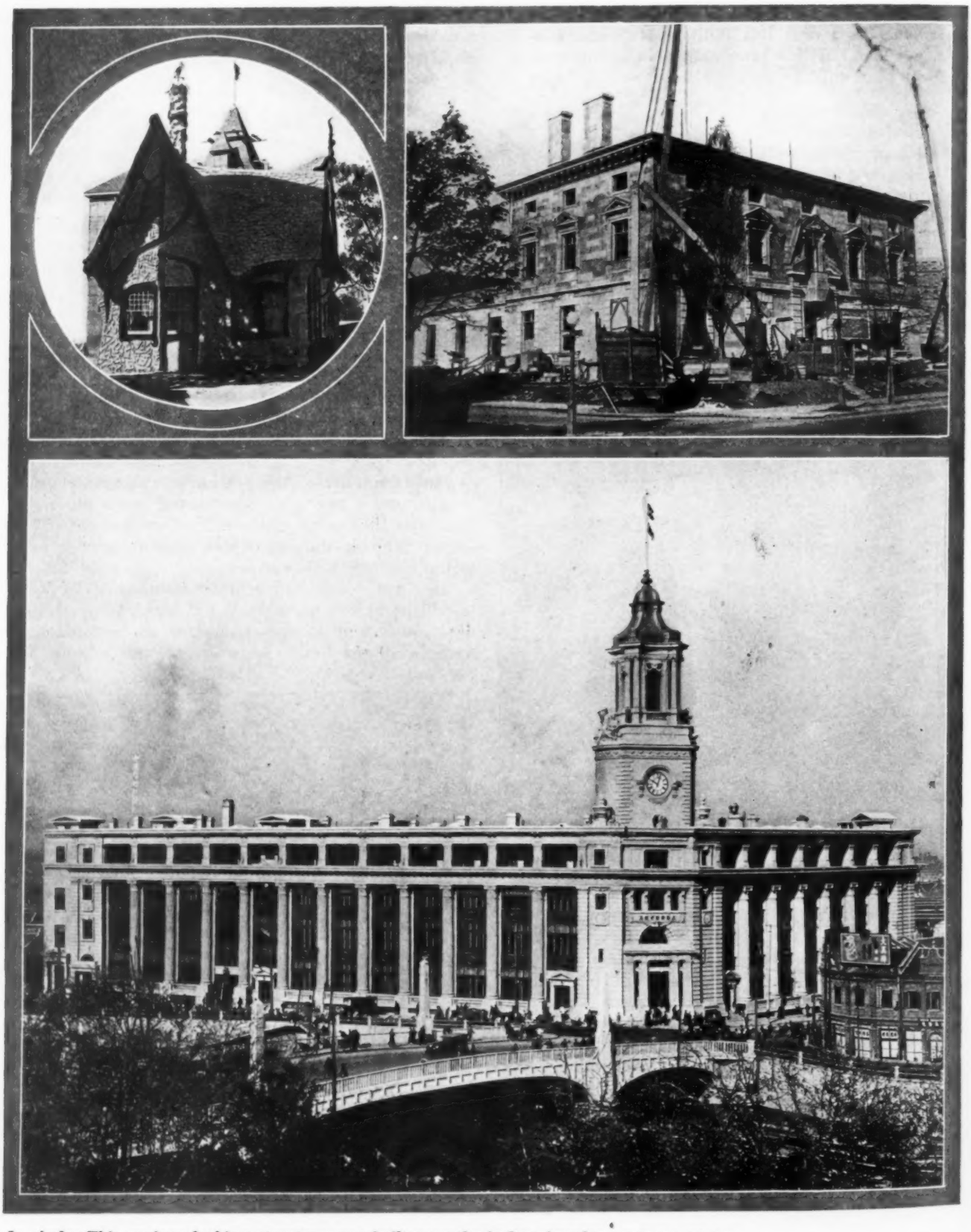
As a net result, the Schmidt building is in better condition at the present than it was at any time in its history, and it is possible for the contractor to remove all the braces between it and the hotel and proceed with the construction of the hotel addition without interruption from the large cross beams.



BRACES INSIDE SCHMIDT BUILDING

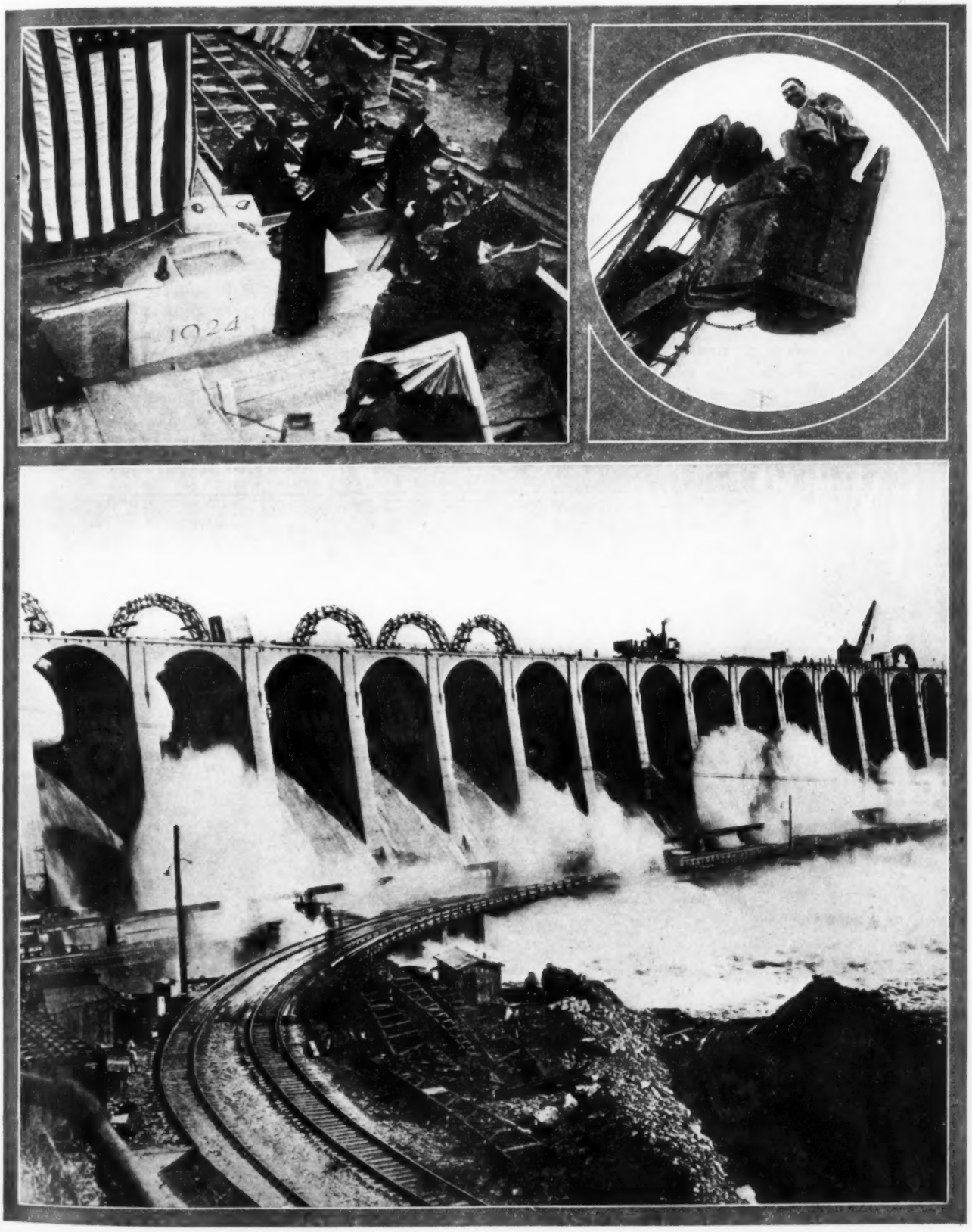
The photographs on this page show the manner in which the Schmidt Building was braced both indoors and out in order to prevent a total collapse. Mr. Everitt's plan has effected a big saving in the cost of a difficult job.

A Trio of New Buildings



In circle: This curious looking structure was built recently in Los Angeles. © *P. & A. Photos.*
At the right: The Italian government is putting up this building to house its embassy in Washington. © *International.*
Below: China gets credit for this structure built along classic European lines. It is the new Shanghai building of the Chinese Postal Service. © *P. & A. Photos.*

Three Grand Openings



Above: Governor Pinchot of Pennsylvania laying the corner stone of the great Delaware River Bridge. © *International.*
In circle: Jack Dempsey celebrating the breaking of ground for a new pugilistic stadium in Los Angeles by taking a ride in the bucket of the shovel. © *International.*
Below: The water goes over the spillway of the great Wilson Dam at Muscle Shoals for the first time. © *P. & A. Photos.*

COMBINATION HAUL PROVES EFFICIENT

Ohio Contractor Uses Light Railway and Trucks on Highway Job

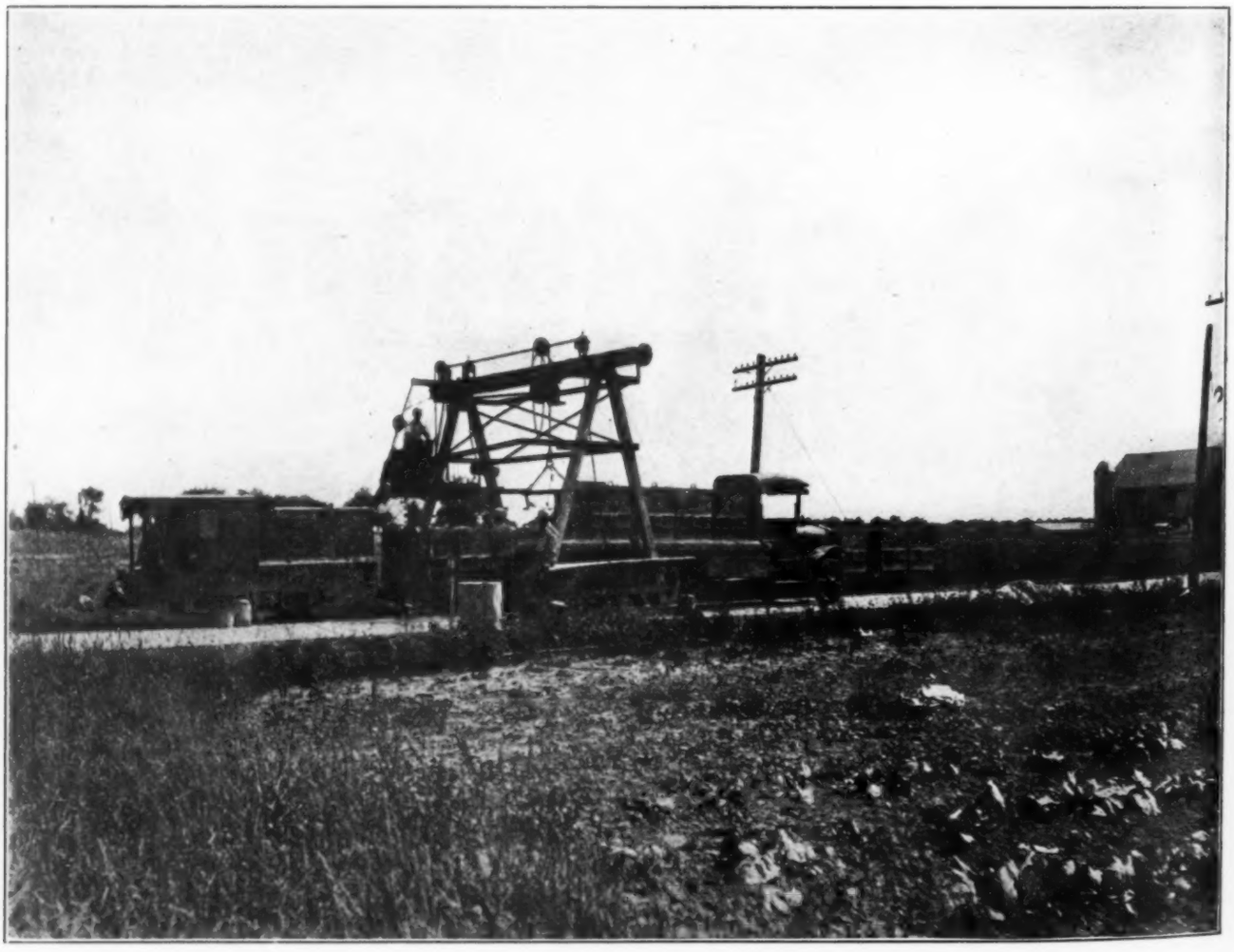
USING a well balanced combination of truck and light railway haulage, the Mellert & Weidener Company of Medina, Ohio, under very adverse weather conditions, successfully finished last summer 2.4 miles of 16-ft. concrete road. The Ohio State Highway Department let the contract for this job.

Inasmuch as this work was executed during an unusually wet season, from June 7 to July 20, and an unusually heavy rain fell at the time of the "Lorain Cyclone," with its costly delays to other contractors in the district, it merits particular attention and the advantages of the combined system are emphasized. In spite of the excessive rainfall during this period the only delays were caused by the rejection of stone from the quarries, as the stone delivered was covered with mud due to flooding of the quarries.

The first 1½ miles of road were built from the industrial track. Before this was completed, part of the road had undergone a 21-day curing, so that trucks could later be operated on the finished pavement. The track alongside the finished road on which trucks could haul was moved up ahead and the transfer point also was moved. Each day after the first moving of track the transfer point was moved ahead about 500 ft., which was the average run per day. This operation was repeated until a point 1½ miles from the end of the job was reached. From there on the transfer point was stationary and the job finished from the track.

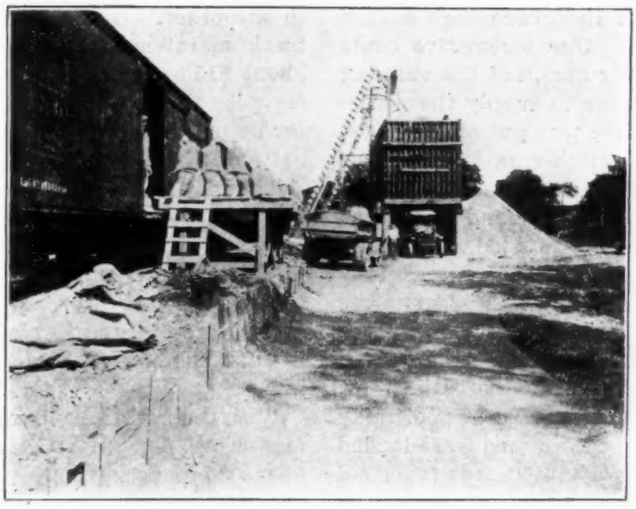
The minimum haul for the truck was about 1 mile, this being the distance of the proportioning yard from the beginning of the job. The maximum haul for the trucks was 2 miles. An average of four 5-ton trucks were used; three at the minimum haul and five at the maximum haul. This equipment supplied the mixer at the rate of 40 batches per hour.

The trucks, each carrying four steel batch boxes with water-tight cement compartments, were loaded at the material yard; the stone and sand from bins and the cement from cars. Cement storage for 2000 bbl. was provided, and if conditions required cement could be loaded from the shed. The stone bin had a capacity of 5 cars. The sand bin had a capacity of ½ car. Both were unloaded by machines.



OUTFIT DESIGNED BY CONTRACTORS TO TRANSFER BATCH BOXES FROM TRUCKS TO LIGHT RAILWAY

The loading of the four batch boxes required 5 min. The personnel at the material yard was: 5 men handling cement and 4 men handling stone and sand. The loaded batch boxes were hauled to beginning of job and then transferred to the narrow-gage cars and hauled to the mixing plant.

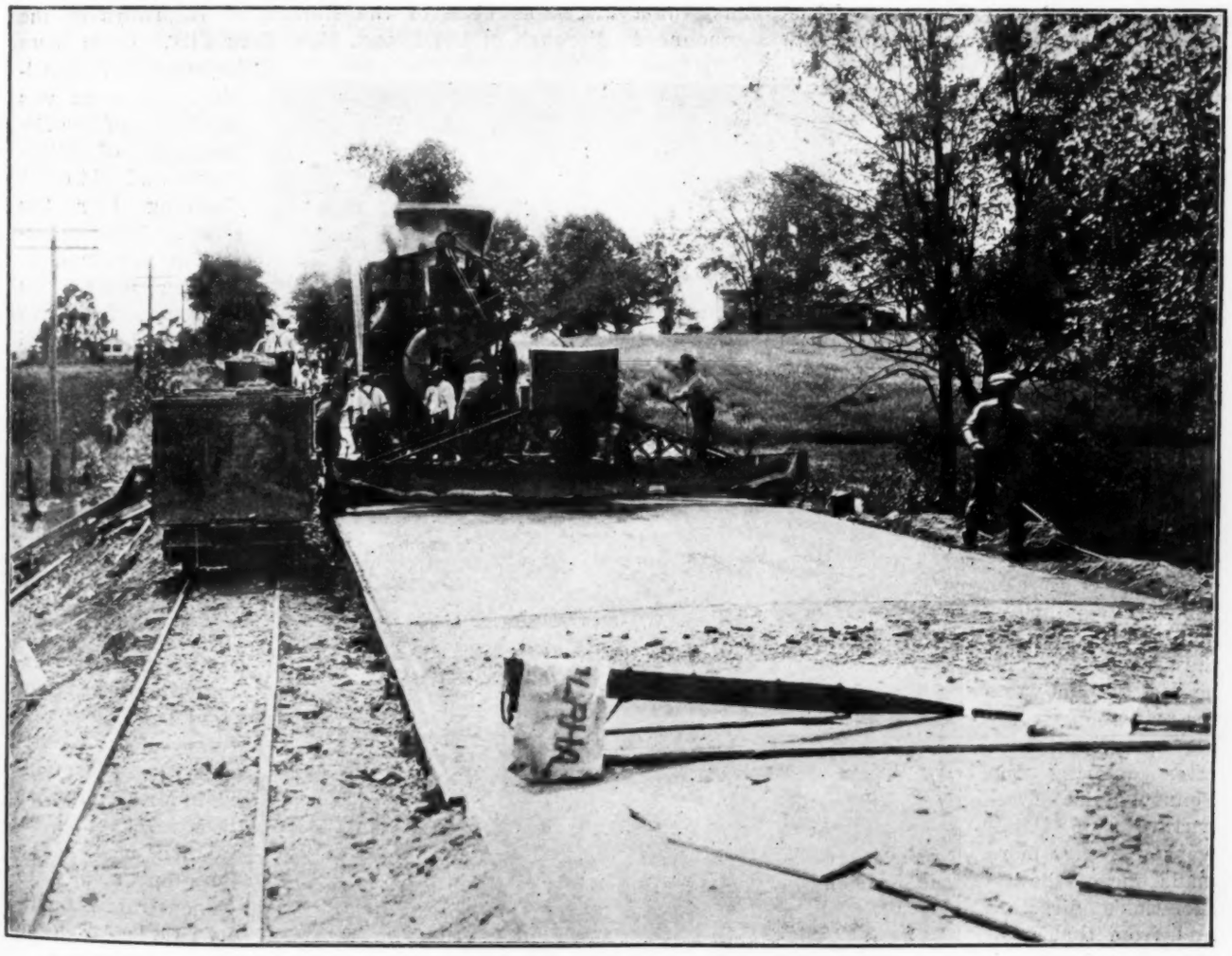


MATERIAL YARD SHOWING TRUCKS LOADING

The equipment used for transferring was built by the contractors. From a steel I beam, supported by two wooden A frames on each side of road, was hung a chain hoist. The operating power was an engine removed from a small motor car and mounted on a platform on one side. The three operating pedals on the engine, on which were fastened levers, formed the controls. When the transfer was to be moved ahead, a truck was backed underneath, the transfer raised, placed on a 6 x 6 across the bed of truck. This operation was simple and quick and the whole machine could be moved readily. The apparatus complete cost about $1,000.

To transfer four batch boxes from trucks to road car required 5 min. Five men were required, one operating transfer, two on the transfer bale, and two more placing boxes and shifting cars.

On the first half of job one locomotive hauling seven cars with two batches each easily supplied the mixer at the rate of 40 batches per hour. On the last half of job a 5½ per cent grade was encountered and two locomotives were put into use. Here the split team method was used. The cars were coupled up three in front and three in rear of the locomotive. When the grade was reached the rear three cars were left at the bottom and the three in front pushed up the hill. The locomotive left these and returned for those



MATERIALS ARRIVING AT THE MIXER

at the bottom. At the top of the grade the six cars were coupled together again. One locomotive could make the grade with five or six cars, but the running time was cut down, and in order to supply the necessary batches another locomotive was put on. At first this locomotive was used to switch cars at the mixer and to make an occasional trip when required. Later, the above explained method was used, and it relieved the strain on one locomotive and divided the burden equally between two. Two locomotives and four trains of six cars each were used, the locomotives switching from the loaded to empty trains at the mixer and at the transfer point.

Two locomotive operators made up the train crew. It took four men from 2 to 3 hr. to take up and relay 500 ft. of track. When the track sections were loaded on the car, a locomotive would haul it from one end to the other. One man was detailed continually on track maintenance. The contractor figured it cost about $150 per mile to lay and take up track. This includes the switches, one of which was at the transfer point, another at the mixer, and one passing siding between these two points.

The paver was loaded with 5-bag batches of 1:1½:3 mix. Besides the operator and firemen four men were required to handle batch boxes from cars to skip and to shift the cars. Behind the mixer five men did all the work. Three spread the concrete and placed the circumferential reinforcing used. One man operated a mechanical finisher and one man acted as helper to him.

With the use of a subgrader, seven men with a foreman were able to set all forms and keep subgrade ahead of paver.

CONNELL TO HEAD ROAD BUILDERS

Nation's Leading Highway Organization Chooses Pennsylvanian as New President—Will Take Office in May

THE new president of the American Road Builders' Association will be W. H. Connell, Engineering Executive and Deputy Secretary of the Pennsylvania Department of Highways. His election was announced at the business session of the annual convention in Chicago, Jan. 6 to 9, and in accordance with the constitution of the association he will take office May 1.

Mr. Connell has been identified with road building and with the American Road Builders' Association for many years. For about ten years he was a member of the board of directors of the association, finally becoming a vice-president. He declined to hold further office in the association when he left public work for private engineering practice, but after entering the Pennsylvania Department of Highways was once more made one of the association's directors and from that position has been advanced to the presidency of the organization.

W. H. CONNELL

Mr. Connell first became well known in highway work as head of the Bureau of Highways of the Borough of the Bronx, New York City. From there he went to Philadelphia, where he was in charge of the Department of Highways and Street Cleaning for five years. After engaging in private engineering work upon retirement from that position, he returned to a public position when he entered the Pennsylvania Department of Highways. As engineering executive of that department, Mr. Connell has been one of the leaders in highway construction and maintenance in the United States. During the absence of Paul D. Wright, secretary of the department, because of illness, Mr. Connell has been in charge. Mr. Connell now has a new opportunity to demonstrate his ability as a leader in the highway industry.

COMPRESSED AIR SPEEDS UP WORK ON BIG TRAINSHEDS

A MOTOR-DRIVEN compressor having a capacity of 300 cu. ft. of free air per min. played a highly important part in the erection of the steel frame for the extensive trainsheds at the new Union Station in Chicago. By means of this compressor the hoist of a 5-ton traveling derrick was operated, as were six riveting hamers and reamers. This outfit gave a pressure of 110 lb. in the air receiver on the derrick. The greatest length of pipe used from the compressor to the tool was 1200 ft. Half of this was 3-in. pipe. Then there were 300 ft. each of 2-in. and 1½-in. pipe. Besides, there was need for 100 ft. of ¾-in. hose. The trainsheds cover a tract 1750 ft. long and 250 ft. wide. The work called for the erection of about 5000 tons of steel.

SPECIAL DERRICK MOUNTED ON HEAVY TIMBERS TO PROTECT PLATFORM

Transverse girders placed 16 ft. above the rails made it necessary to carry the boom of the derrick higher than this level in order to get the required reach. Accordingly, a timber traveler was constructed. This had an A-frame mast and was provided with a 50-ft. boom on the upper deck. The head of the mast was supported by two stiff-legs. This derrick had a hoisting capacity of 5 tons; the heaviest pieces handled by the derrick weighed 3 tons. A two-drum hoisting engine was located at the rear of the lower deck. It was operated by compressed air from a large tank and served the fall rope, the boom swinging line and the topping lift.

Because it was specified that the derrick should not rest on the baggage platforms over which it traveled, it was necessary to provide a special support. Heavy timbers were used to carry the sills and rails for the double-flanged wheels of the traveler.

W. J. Howard, president of the Kelly-Atkinson Construction Company, Chicago, designed this plant.

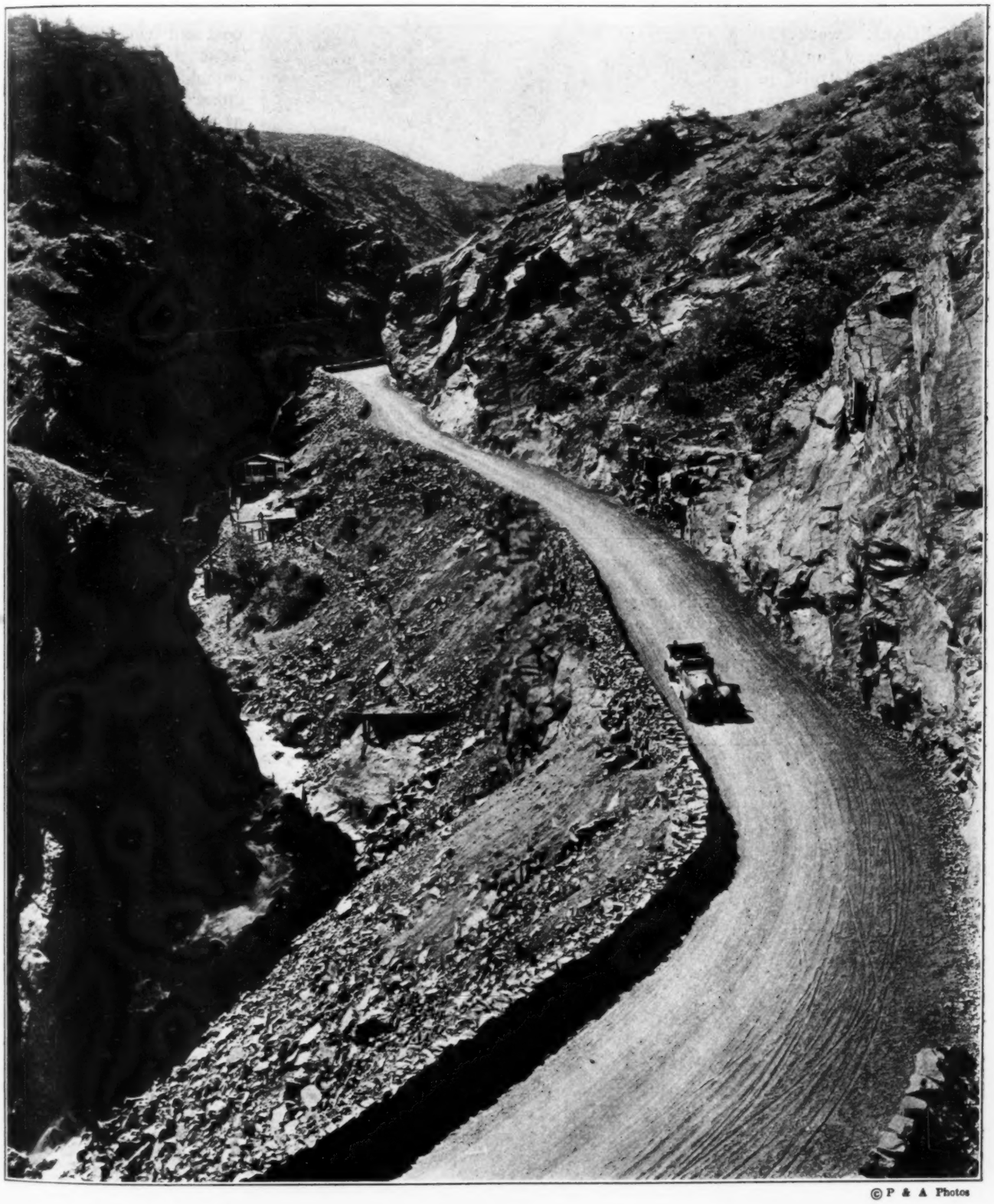
STEEL WORK OF NEW TRAINSHED OF CHICAGO UNION STATION

COLORADO CONTRIBUTES TWO CHAPTERS

© P & A Photos

THE change wrought by the automobile was never more clearly illustrated than in the contrasted photographs on these two pages. The photograph at the left shows the famous Ute Pass near Colorado Springs twenty years ago, and the right-hand photograph shows the present road. It looks as though the old road carried the denser traffic, but that is not the case. The vehicles in those days, pulled by horses,

IN HISTORY OF AMERICAN HIGHWAYS



© P & A Photos

were slow moving affairs that traveled in caravans without room to pass each other, thereby letting the slowest vehicle set the pace.

The present road, shown on the right, carries thousands of automobiles and its volume of traffic is much greater than in the old days, when the road was used to transport supplies from Colorado Springs to Leadville and to bring silver back from the mines.

DEEPENING THE DETROIT RIVER

Construction Fleet Operates in Busy Waterway—Channel Is Being Widened

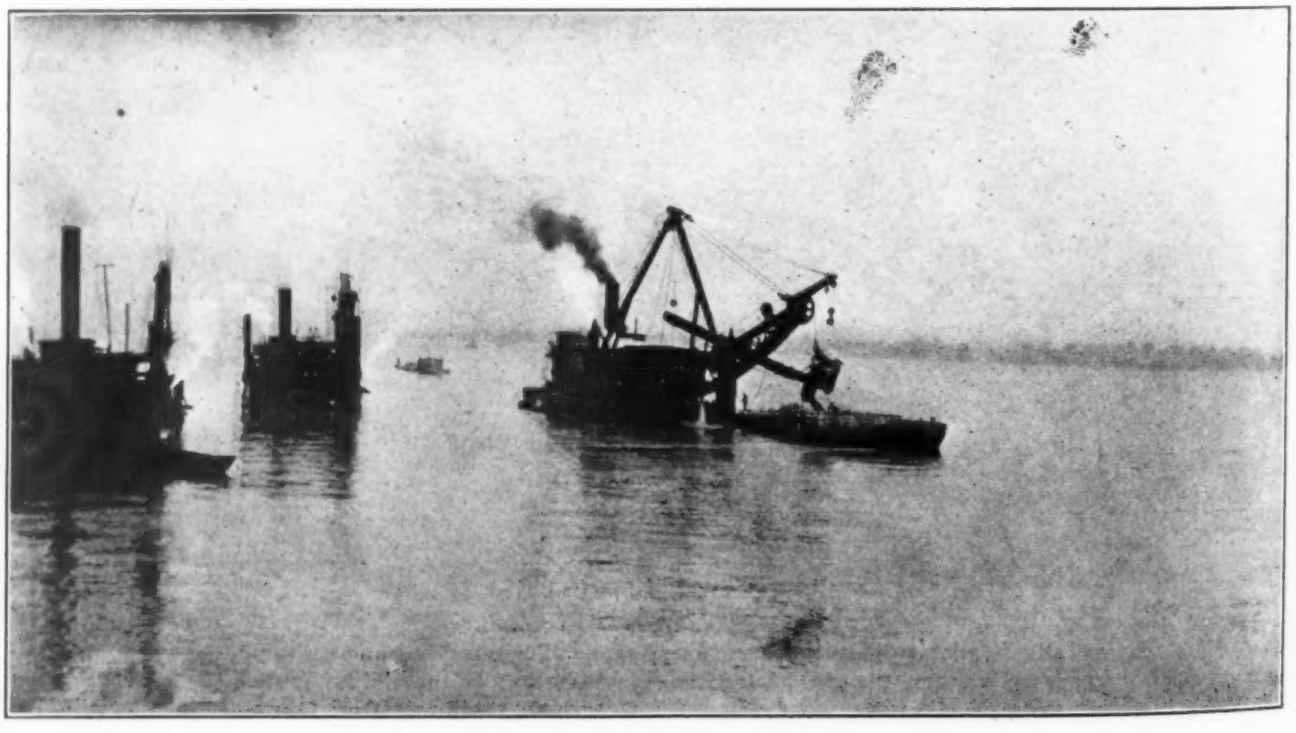
BIG-SCALE work is under way on the river below Detroit in order to deepen the channel for the ever-growing lake traffic. This work has a direct bearing on the Great-Lakes-to-the Ocean waterway. Anticipating the heavy volume of traffic that the future must necessarily bring, the United States Government is making its preparations accordingly. A small fleet is at work on the lower Detroit River, preparing what will be known as the enlarged Livingstone Channel.

BREAKING UP THE SUBMERGED LEDGES

The plan is to make the channel 11.85 miles in length, 7 miles of which are in the river and 4.85 miles in Lake Erie. The channel has a depth of 21.8 ft. On the completion of this project the upper part of the channel in the river will be 450 ft. wide; the lower part extending below Bois Blanc Island and out into Lake Erie will be 800 ft. wide.

To do this work there has been assembled a fleet of two dredges, two drill boats, two tugs, a supply boat and two coal lighters. After the drill boats have pounded holes in the limestone rock that is found at the bottom of the channel, a charge of dynamite is placed—then the drill boats move away to a safe distance, and across the water comes the dull boom of a dynamite explosion. Tons of water are shot high in the air, forming for a moment a geyser, that quickly disappears as the water streams down again. Then the dredges come back to the scene of action and thrust down their giant arms to find the great pieces of limestone that have been dislodged and to bring them to the surface.

The original channel, opened in the fall of 1912, and named after Wm. Livingstone, then president of the Lake Carriers' Association, was 300 ft. in width. It was opened for the traffic of down-bound vessels, but even before the project was completed it was perfectly evident to the Board of Engineers that a 300-ft. channel would not be wide enough to handle

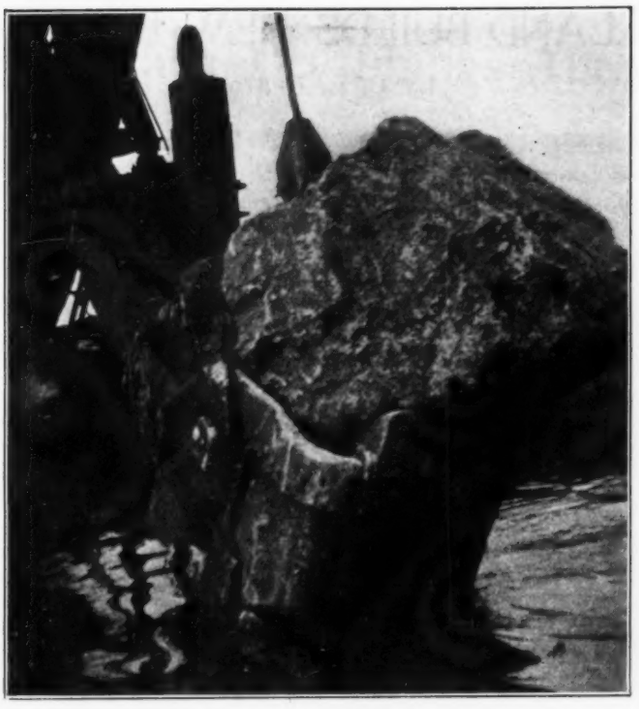


GETTING OUT THE LOOSE ROCK

the steadily increasing lake traffic. They recommended widening the channel to 450 ft., and this is the recommendation that is now reaching fulfillment. The work has been carried on in four sections.

Engineers feel that this project, whose cost runs into the millions of dollars, is fully justified by the traffic that passes through this stretch where Great Lakes traffic is the heaviest. The Detroit River is only 28 miles in length, and yet it holds the world's record for tonnage. More than three-fourths of the entire commerce of the Great Lakes passes through this portion. Boats and barges laden with the varied products of the North and West pass through on their way to Ohio or Eastern ports; with ore, grain, lumber, and other bulk products. As the lake season is comparatively short, these vessels must be kept on their course without blockades. The work now nearing completion will help to prevent such blockades and will be the best safeguard for the future of navigation via Detroit.

The M. Sullivan Dredging Company are doing the present work. Colonel Edward M. Markham, Corps of Engineers, is in charge of operations.



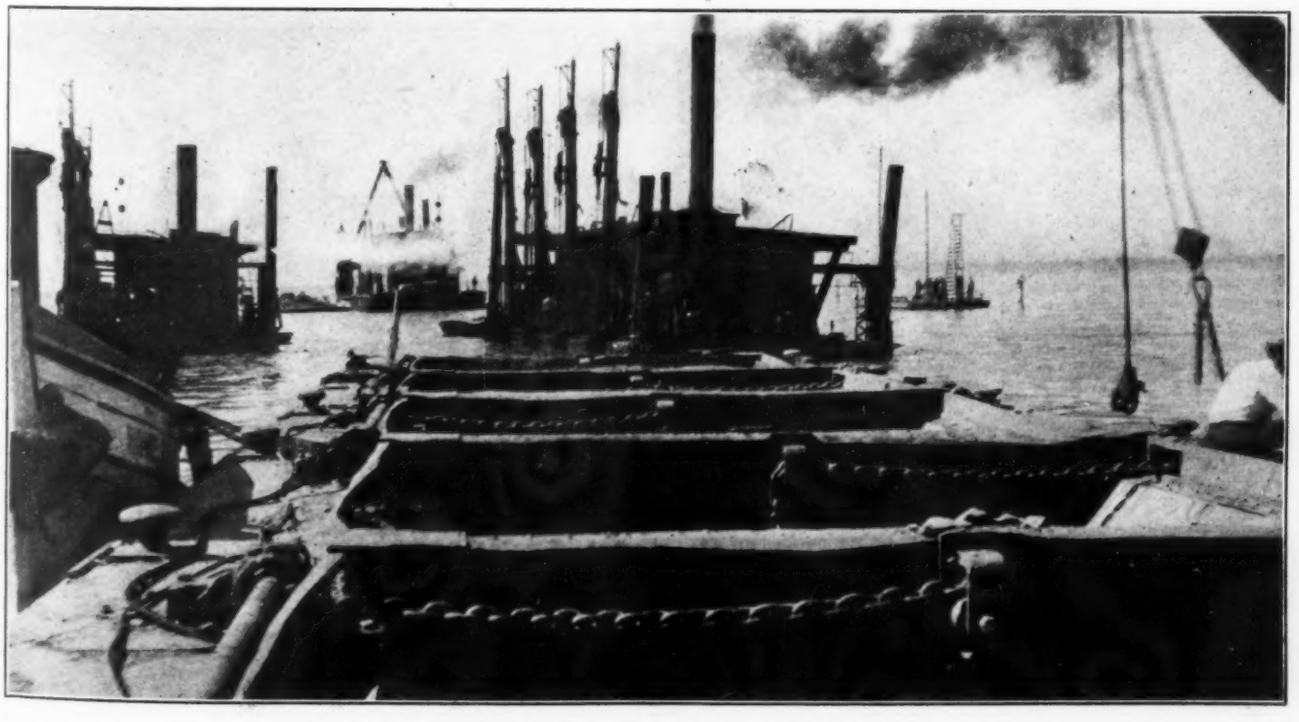
BIG PIECES ARE HANDLED

The photographs accompanying this article give a good idea of the sturdiness of the equipment needed in work of this sort. It is difficult to use explosives under water and at the same time break up the rock into small pieces. Big chunks such as that shown at the top of this page are frequent, which means that in order to handle them the equipment must, first of all, be strongly built. The big barges shown at the bottom of the page are so well built that they can stand all sorts of wear and tear.

The job is a long one, extending over a considerable period of years, which made it possible to assemble a fleet designed for this particular work.

The work of conducting a job of this sort without interfering with the heavy traffic which passes through the Detroit River is in itself no small problem. Keeping out of the other fellow's way is sometimes as big a job as the actual work to be done.

Every precaution must be taken to do the necessary blasting in such a way that the steady stream of vessels passing through the river will not be endangered. It is a hard job that is being handled with remarkable efficiency by the Sullivan organization.



HEAVY BARGES ARE USED ON THIS JOB

CLEVELAND BUILDS NEW BOULEVARD

By C. P. Burton

THE city of Cleveland, or, more accurately speaking, the Board of Park Commissioners of the Metropolitan Park District, has started on a plan of boulevard and park construction which eventually will result in a boulevard 90 miles long encircling Cleveland, from the Lake on the one side to the Lake on the other, a distance of from 15 to 20 miles from the center of the city. This boulevard will connect at two points with Cleveland's fine city park system and

HAULING WAGON WITH SMALL TRACTOR

will follow the windings of the valleys of creeks and rivers, which give to the district surrounding Cleveland a rare beauty.

The first contracts in the furtherance of this plan have been completed; one by the Robert J. Burke Company and the other by the Southern Construction Company, both of Cleveland.

The Robert J. Burke Company's contract was for the building of a boulevard into the big creek section in the village of Parma Heights. His work was noteworthy from the fact that he experimented with dump wagons hauled by a tractor, working tractor-hauled wagons and team-hauled wagons on the same job. A

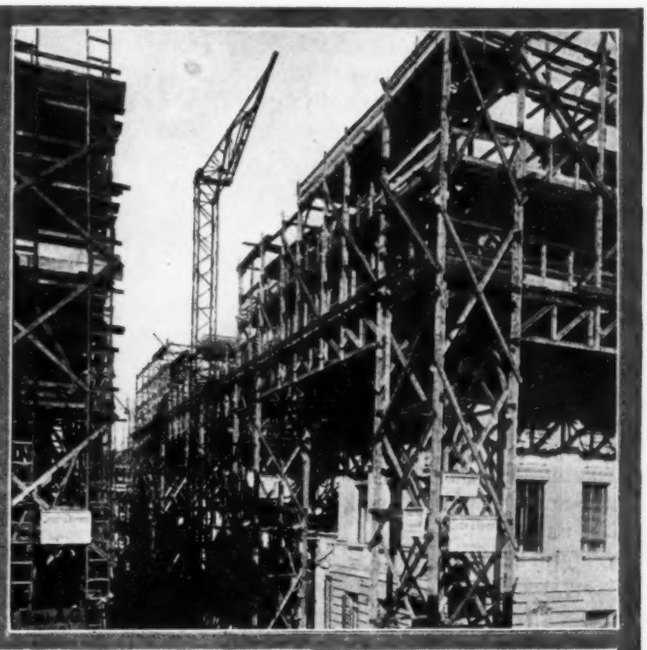
ELEVATING GRADER ON THE JOB

steam shovel was installed for the excavation, the haul being about 500 ft. The wagons were of the bottom-dump type, their capacity being 1½ cu. yd. An interesting detail in this connection is that the wagons had seen hard service for twelve years and were still going strong. This firm buys the best equipment on the market and works it as long as it will hold together. In the same vicinity the Burke company was working an elevating grader that was nearly as old as the wagons.

"That elevating grader was purchased in 1914," said Mr. Burke, "and it never has lost a day when I wanted it to work. I can go out with it now and move 1000 cu. yd. a day."

LOADING WAGONS WITH STEAM SHOVEL

How They Do Things Abroad



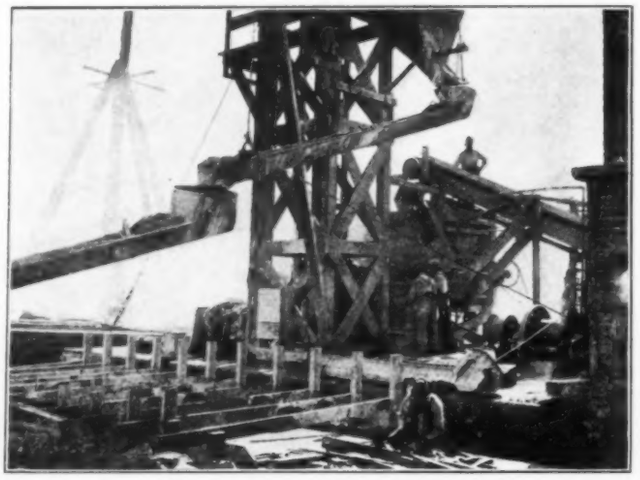
At the left: A British record in bridge building was made when 60 men took down the old bridge over the River Lea, between Broxbourne and Roydon and put in the new one in 15 hours working time. © *Keystone.*
At the right: A new banking house is being put up in Berlin which gives a good idea of German building methods. © *P. & A. Photos.*

Below: The Robert E. Lee Memorial in Syra, Greece, dedicated recently as an orphanage for the Near East Relief. It was built almost entirely by the refugees and older orphan boys. © *Int.*

FLOATING MIXING PLANT BUILDS BIG BREAKWATER

Handles Concrete Efficiently on War Department Job at Ludington, Michigan

A WELL-EQUIPPED floating mixing plant, with auxiliary vessels, enabled the contractor, S. M. Siesel & Co. of Milwaukee, to make excellent progress in building the 1700-ft. breakwater recently completed at Ludington, Mich., to replace an old timber structure. The work was completed in three months after pouring of the concrete commenced. Owing to settlement of the cribs, the total amount poured was 7730 cu. yd.

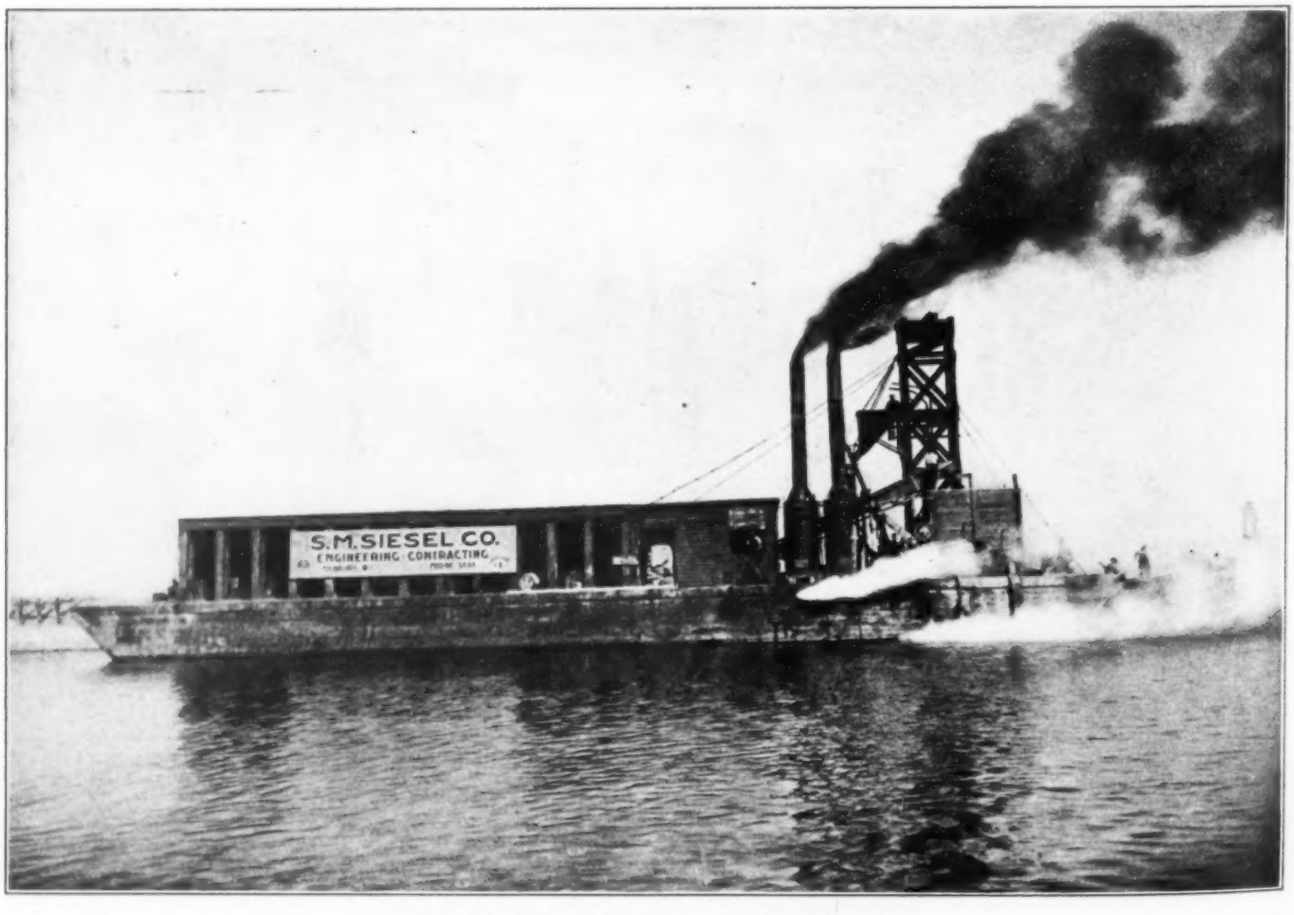


A CLOSE UP OF THE WORK

The floating mixing plant consisted of a 28-S mixer, two sets of storage bins, a belt conveyor to carry aggregates from the large bin to the mixer, and a skip hoist with spouting system. The mixer was located at one end of the scow. It was so placed that the operating platform was flush with the deck. A large hopper, having two compartments and a total capacity of 5 cu. yd., kept the mixer supplied. This hopper was fed from an inclined belt conveyor that brought the aggregates up from the hold, where the conveyor ran horizontally beneath the storage hoppers. It was loaded from undercut gates. When the conveyor was inclined at a slope of 5 in. to the foot, trouble was caused by stone sliding back. This defect was overcome, however, by fastening to the conveyor belt strips of belting 2 ft. apart.

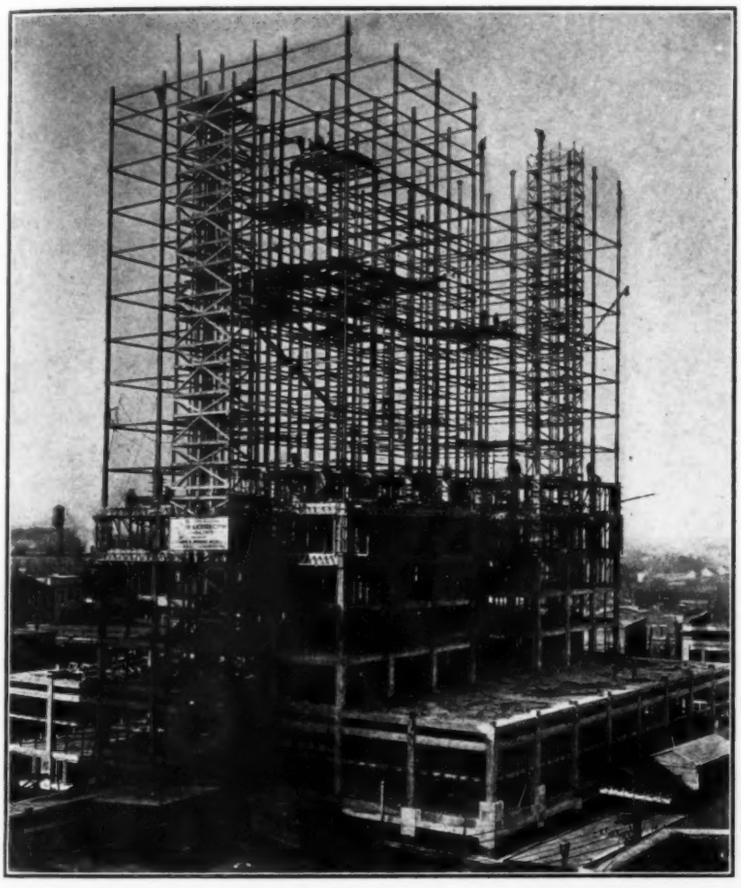
The concrete, on being mixed, was discharged into a skip hoist and was spouted directly to the work. Although operations proceeded in the open water, batches were handled at 1½ min. intervals.

The Siesel company handled the contract for the War Department under the direction of the district engineer, Major Gilbert Van B. Wilkes, U. S. A.



THE FLOATING MIXING PLANT ON THE JOB

ONE MONTH'S PROGRESS



NOV. 19, 1924

THE two photographs on this page show the Washington Duke Hotel at Durham, N. C., the one on the left as it appeared on Nov. 19 last and the other as it was Dec. 19, thirty days later. The Blackford Company of Durham are the builders who have handled this job in such quick time.

On this hotel the excavation was begun June 26, and the Blackford Company's schedule called for the roof to be on Jan. 15, 1925. About two weeks were gained on the excavation work, but during September 27 days were lost on account of rain. The Blackford Company then had to make up the lost time and G. T. Blackford, president of the company, describes the speeding up process as follows:

"With an almost perfect working organization, we were able to pour two floors of this building each week with the steel crew keeping well ahead of us, and we realized when we were about on the sixth floor that we were gaining on our schedule, and if we would keep up the rate at which we were then going we could put the roof on the building ahead of our schedule, and this is what actually happened as we poured the last of the roof slab on Dec. 19, whereas our schedule called for it to be finished Jan. 15.

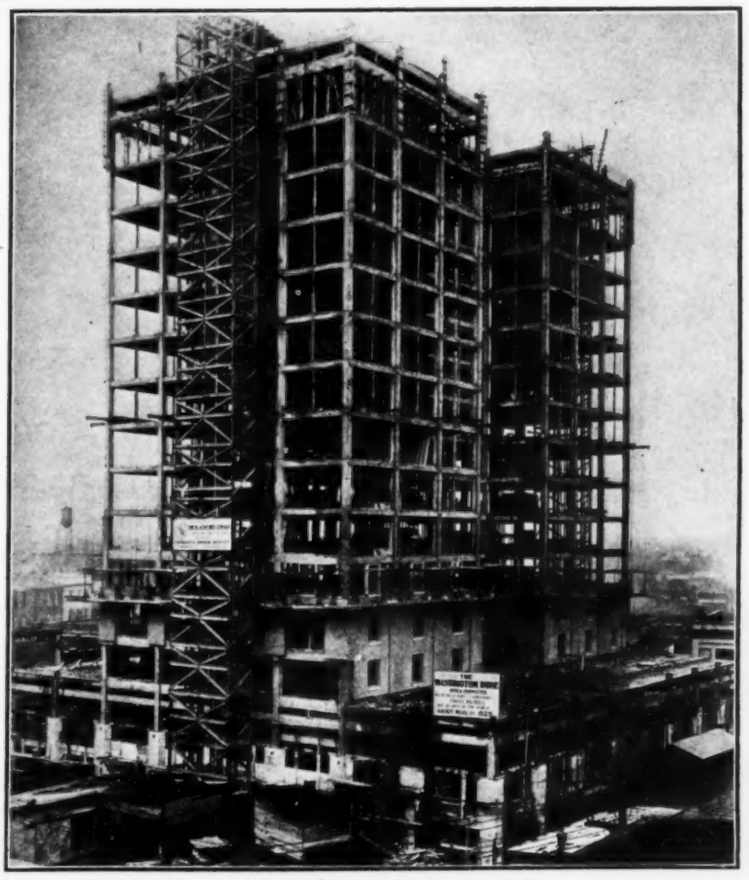
"We attribute the record that we made primarily to organization and hard work."

The size of the job may be judged not only from the photographs, but by the fact that altogether about 3600 cu. yd. of concrete and about 1015 tons of steel have gone into the building. The construction of the walls inside the building will require 250,000 hollow tiles and the facing of the hotel will consume 300,000 face brick. Indiana limestone will be used for the trimming.

Van Rensselaer P. Saxe, designing engineer, who has had general supervision of the work, has congratulated Mr. Blackford on the remarkable speed which was made. In his long experience in various sections of the country he has never seen a job put through so well and so quickly.

The Blackford Company's schedule for the remainder of the work calls for completion of the hotel by July 4 and it is very evident that enough time has been gained to make it certain that there will be no delay in opening the hotel at the appointed time. It is expected that all of the brick work will be completed some time this month and the plastering is now under way.

By completing this job in less time than one year both Mr. Blackford's organization and the owners will add to their profits.



DEC. 19, 1924

Mounted On Used Motor Trucks Each Universal Earns $50-$100 a Day!

These full revolving "Universals" were driven to this job quickly and cleaned it up in a hurry. They each earn from $50 to $100 daily for their owner. On special work they earn more. They unload cars of material, handle cellar excavations and other jobs at big profits, jobs that would not justify the expense of moving any other locomotive crane or shovel to them.

You can drive a Universal to a job at motor truck speed and it is ready to work the instant it gets there. No outriggers are necessary and the quick 5½ r.p.m. swinging rate and high hoisting speeds often mean as big a day's work as larger machines. Under ordinary conditions a Universal is capable of handling one car of sand, coal, broken stone, etc., per hour at a total cost of $10 to $15 a day—only one operator required for crane and truck. Crane is transferable from one to another of the following mountings:

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